

ASSIGNMENT

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Batch-04

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1. Implementing CRUD Operations

You implement Create, Read, Update, and Delete operations by calling specific methods on your Sequelize model objects within your controller logic.

- **Create:** Use the `.create()` method to insert a new row into the database.
- **Read:** Use `.findAll()` to retrieve all records or `.findByPk(id)` to find a specific entry by its primary key.
- **Update:** Use the `.update()` method, which requires a `where` clause to specify which record to modify.
- **Delete:** Use the `.destroy()` method with a `where` clause to remove records from the database.

2. Data Validation and Constraints

Sequelize handles data integrity at both the application level and the database level:

- **Model Validation:** These are defined in the model schema (e.g., `isEmail: true, len: [2, 20]`) and are checked before the query is sent to the database.
- **Constraints:** These are database-level rules such as `allowNull: false, unique: true`, or foreign key restrictions that prevent invalid data from being stored.

3. Defining Relationships

Relationships are defined in your model configuration files to link different tables together.

- **One-to-Many:** For a platform where one course has many enrollments, you use `Course.hasMany(Enrollment)` and `Enrollment.belongsTo(Course)`.
- **Many-to-Many:** If a student can join many courses and a course has many students, you use `User.belongsToMany(Course, { through: 'Enrollments' })`.

4. Role of Sequelize Methods

These built-in methods act as an abstraction layer, translating JavaScript code into SQL queries:

Method	Role	SQL Equivalent
<code>create</code>	Inserts a new record.	<code>INSERT INTO</code>

Method	Role	SQL Equivalent
<code>findAll</code>	Retrieves all records.	<code>SELECT *</code>
<code>findByPk</code>	Retrieves one record by ID.	<code>SELECT ... WHERE id = x</code>
<code>update</code>	Modifies existing records.	<code>UPDATE ... SET</code>
<code>destroy</code>	Removes records.	<code>DELETE FROM</code>

5. Handling Database Errors Gracefully

To prevent your server from crashing during database issues, you should use a structured error-handling approach:

- **Async/Await:** Use `try/catch` blocks or an `asyncHandler` middleware (as seen in your `app.js`) to catch rejected promises.
- **Middleware:** Pass errors to a global `errorHandler` (like the one imported in your `app.js`) to send a clean JSON response back to the client.
- **Specific Errors:** Check for specific Sequelize error types, such as `SequelizeValidationError` or `SequelizeUniqueConstraintError`, to provide helpful feedback to the user.

Images

The image shows a Visual Studio Code editor window with a terminal pane at the bottom. The terminal displays the output of `npm init` in a PowerShell shell, showing the creation of a `package.json` file. The `package.json` file is open in the editor, showing a default configuration for a project named `20260119`. The configuration includes fields for name, version, description, main, scripts, keywords, author, license, type, dependencies, and devDependencies. The `scripts` section contains a test script that echoes an error message. The `dependencies` section lists `express` and `react`, and the `devDependencies` section lists `nodemon`.

```
.env
1 Generate code (Ctrl+I), or select a language (Ctrl+K M). Start typing to dismiss or don't show this again.

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
History restored
PS D:\FULLSTACK 2026\20260119> Set-ExecutionPolicy RemoteSigned -Scope CurrentUser
PS D:\FULLSTACK 2026\20260119> npm init
Wrote to D:\FULLSTACK 2026\20260119\package.json:

{
  "name": "20260119",
  "version": "1.0.0",
  "description": "",
  "main": "index.js",
  "scripts": {
    "test": "echo \"Error: no test specified\" && exit 1"
  },
  "keywords": [],
  "author": "",
  "license": "ISC",
  "type": "commonjs",
  "dependencies": {
    "express": "^5.2.1",
    "react": "^19.2.3"
  },
  "devDependencies": {
    "nodemon": "^3.1.11"
  }
}
```

Ask about your code
AI responses may be inaccurate.
Generate Agent Instructions to onboard AI onto your codebase.

Explore and understand your code
Ask Auto

C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm init express

Need to install the following packages:

create-express@1.0.4

Ok to proceed? (y) y

npm warn deprecated source-map-url@0.4.1: See <https://github.com/lydell/source-map-url#deprecated>

npm warn deprecated urix@0.1.0: Please see <https://github.com/lydell/urix#deprecated>

npm warn deprecated resolve-url@0.2.1: <https://github.com/lydell/resolve-url#deprecated>

npm warn deprecated source-map-resolve@0.5.3: See <https://github.com/lydell/source-map-resolve#deprecated>

npm warn deprecated inflight@1.0.6: This module is not supported, and leaks memory. Do not use it. Check out lru-cache if you want a good and tested way to coalesce async requests by a key value, which is much more comprehensive and powerful.

npm warn deprecated formidable@1.2.6: Please upgrade to latest, formidable@v2 or formidable@v3! Check these notes: <https://bit.ly/2ZEQIAu>

npm warn deprecated babel-preset-es2015@6.24.1: 🙌 Thanks for using Babel: we recommend using babel-preset-env now: please read <https://babeljs.io/env> to update!

npm warn deprecated glob@7.2.3: Glob versions prior to v9 are no longer supported

npm warn deprecated superagent@2.3.0: Please upgrade to superagent v10.2.2+, see release notes at <https://github.com/forwardemail/superagent/releases/tag/v10.2.2> - maintenance is supported by Forward Email @ <https://forwardemail.net>

npm warn deprecated core-js@2.6.12: core-js@<3.23.3 is no longer maintained and not recommended for usage due to the number of issues. Because of the V8 engine whims, feature detection in old core-js versions could cause a slowdown up to 100x even if nothing is polyfilled. Some versions have web compatibility issues. Please, upgrade your dependencies to the actual version of core-js.

> fullstack2026@1.0.0 npx

> create-express

C:\Users\91939\OneDrive\Desktop\Fullstack2026>

> fullstack2026@1.0.0 npx

> create-express

C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm install express

added 65 packages, and audited 66 packages in 4s

22 packages are looking for funding

run `npm fund` for details

found 0 vulnerabilities

C:\Users\91939\OneDrive\Desktop\Fullstack2026>

run `npm fund` for details

found 0 vulnerabilities

C:\Users\91939\OneDrive\Desktop\Fullstack2026>npm i -D nodemon

added 27 packages, and audited 93 packages in 2s

26 packages are looking for funding

run `npm fund` for details

found 0 vulnerabilities

C:\Users\91939\OneDrive\Desktop\Fullstack2026>

PS D:\FULLSTACK 2026\20260119> {

>> "name": "John",

>> "email": "john@gmail.com"

>> }





